

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2022-141

Anonymous Referee #2

Referee comment on "Low-flow estimation beyond the mean – expectile loss and extreme gradient boosting for spatiotemporal low-flow prediction in Austria" by Johannes Laimighofer et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-141-RC2>, 2022

The manuscript "Low flow estimation beyond the mean - expectile loss and extreme gradient boosting for spatio-temporal low flow prediction in Austria" by Laimighofer et al. proposes an extreme gradient tree boosting model (XGBoost) for predicting monthly low flow in ungauged catchments. They introduce a new objective function, the expectile loss functions, for the model fitting and demonstrate the model by its application to a comprehensive dataset of 260 stream gauges in Austria covering a wide range of low flow regimes. The proposed model and its application to a dataset from Austria are interesting and very well presented. Also, the discussion is comprehensive and almost fair. However, I have one comment about the collinearity and a few minor comments, which are described below:

- My only concern is the potential existence of collinearity of temporal predictors as the authors considered CWB, CWB_center, and CWB_SDI all together as potential predictors for finding the best model. It would be good to see an analysis about if including collinear predictors yields a significant increase in the model performance compared to when only not collinear predictors are considered for the model fitting.
- Figure 2 is not described or presented in the main text.
- L151: Define CV. I understand that CV means cross-validation, but that could not be evident for general readers.
- L151: A brief description of the 10-fold CV could be helpful for the reader.